AMENDMENTS

Please amend the application as follows:

In the Specification:

Please amend the paragraph starting on page 6, paragraph 23, as follows:

Several embodiments of an insulation system herein utilize the idea that several layers or stacks of honeycomb panels having cells of adjacent honeycomb cores that are offset, so as to reduce the area of contact, significantly reduces conduction heat transfer and hence increases the thermal resistance between the honeycomb panels. In addition, the total thermal resistance of an insulation system can be further increased by encasing and sealing each of the honeycomb cores within multiple layers of a radiation barrier material, such as aluminized ~~mylar~~ Mylar™, thereby providing a sealed enclosure. To reduce convective heat transfer, increasing the thermal resistance even more, the interior of the sealed enclosure can be evacuated to provide a vacuum environment so that convective heat transfer within the honeycomb cells is negligible. Manufacturers of honeycomb cores, the structural element of honeycomb panels, have indicated that one way to improve the insulation properties of honeycomb panels, a conventional insulation system, would be to fill the honeycomb cores with foam or other known insulation materials. The conventional insulation system for honeycomb cores, as suggested by the manufacturers, does increase thermal resistance, but adds weight and may add significant cost. In contrast, embodiments of the present invention, as briefly described above and further illustrated in drawings and written text, provide highly insulating, light-weight insulation systems having excellent structural properties and low cost. The basic strength and stiffness attributes of the new insulation systems are similar to the conventional honeycomb insulation system, but the insulation properties are substantially greater. Much of the cost reduction is provided by the replacement of expensive high resistive materials with a vacuum. The stiffness and strength of the new insulation systems are slightly reduced since several layers of honeycomb core are not as strong as a single honeycomb core having the same thickness as the several layers. The difference in strength could be determined and would be understood by those skilled in the art.

Please amend the paragraph starting on page 9, paragraph 27, as follows:

To further reduce radiation heat transfer one or more layers of insulation material 102, a radiation barrier, are preferably placed over the cells of each of the honeycomb cores 114, 124 so that the insulation material 102 covers the opening or the interior of the hexagonal shaped cells. The insulation material 102 encases the honeycomb cores 114, 124 and is sealed to provide an enclosure that may be evacuated. Each of the enclosures preferably is evacuated providing a vacuum container for each honeycomb core 114, 124. When the vacuum container encasing the second honeycomb core 124 is placed in an offset arrangement on top of the vacuum container encasing the first honeycomb core 114, as illustrated in FIG. 1, the combined benefits of each aspect of the elements of the insulation system 100 provide an insulation system 100 with thermal resistance substantially equal to thermal resistance of the best known insulation materials. There are a wide variety of insulation materials 102 that may be used to encase the honeycomb core and that have the ability to retain a vacuum over long periods of time. Such materials include, for example, Teijin™ (an aluminized layer with polyester film and bonding materials), thin aluminum foil, aluminized ~~mylar~~ Mylar™, ~~kapton~~ Kapton™, and others. The encasing materials preferably are coated with vapor deposited metals, such as aluminum, gold or copper, to further reduce radiation heat transfer.

Please amend the paragraph starting on page 15, paragraph 39, as follows:

A series of tests were conducted to evaluate and verify the performance of the insulation system 100. The inventors showed that very low thermal conductivity is achieved with a simple version of the insulation system 100. Due to the limitations of the test apparatus only two honeycomb cores were used, each wrapped with a single sheet of insulation material. Each sheet was cut from an Ozark Trail Emergency ~~Blanket~~ Blanket ™, marketed by Wal-Mart. The two cores were placed in an offset arrangement between two outer cold plates, with a resistance heater foil between the two. The heat flux was determined by measuring the electric power of the resistance heater foil. Care was taken to ensure steady-state operation, minimum effects of the edges, etc. The test technique was also used to measure the performance of best in class insulators such as ~~Aerogel~~ Aerogel ™. The results of the tests verified the concept and provided information for predicting the properties of the insulation system 100. The insulation system 100 may also function as a space debris shield, a sound attenuator or a vibration attenuator.